

What is claimed is:

1. (original) A medical device for measuring the concentration and/or percentages of one or more hemoglobin derivatives in a blood sample taken from a patient comprising;

a) a housing;

b) a holder for the blood sample contained within the housing;

c) a light generating apparatus contained within the housing comprising at least one compact light source emitting light in the visible region of the spectrum or at least one polychromatic light source and at least one light filter for separating the light from the polychromatic light source into distinct bandwidths along the visible spectrum; wherein the number of light sources or filters in the visible region of the electromagnetic spectrum is less than or equal to the number of hemoglobin derivatives to be measured;

d) a light receiving apparatus contained within the housing comprising at least one light detector receiving light for determining one or more absorbance values of the blood sample at one or more wavelengths within the bandwidth of each light source or filter in the visible region of the spectrum; and

e) a microprocessor for determining the concentration of each hemoglobin derivative from the measured absorbance values.

2. (currently amended) ~~The medical device of claim 1~~

A medical device for measuring the concentration and/or percentages of one or more hemoglobin derivatives in a blood sample taken from a patient comprising;

a) a housing;

b) a holder for the blood sample contained within the housing;

c) a light generating apparatus contained within the housing comprising at least one compact light source emitting light in the visible region of the spectrum or at least one polychromatic light source and at least one light filter for separating the light from the polychromatic light source into distinct bandwidths along the visible spectrum; wherein the number of light sources or filters in the visible region of the electromagnetic spectrum is less than or equal to the number of hemoglobin derivatives to be measured and wherein the compact light source(s) or light filter(s) have bandwidths of about 7-50 nanometers;

d) a light receiving apparatus contained within the housing comprising at least one light detector receiving light for determining one or more absorbance values of the blood sample at one or more wavelengths within the bandwidth of each light source or filter in the visible region of the spectrum; and

e) a microprocessor for determining the concentration of

each hemoglobin derivative from the measured absorbance values.

3.(original) The medical device of claim 1, wherein the optimal wavelength for determining the absorbance value(s) for a hemoglobin derivative depends on the characteristics of the compact light source and/or optical filter used in the device.

4.(original) The medical device of claim 1, wherein the overall size of the device is sufficiently small so as to be hand-held.

5.(original) The medical device of claim 1, wherein the portable device weighs less than about 50 pounds.

6.(original) The medical device of claim 1, wherein at least one light source emits light ranging from about 450 nanometers to about 700 nanometers.

7.(original) The medical device of claim 1, wherein the compact light sources comprise light emitting diodes, light emitting lasers, a polychromatic light or combinations thereof.

8.(original) The medical device of claim 1, wherein the light receiving source(s) comprise photo detectors, photo diodes, pin diodes, photo transistors, CCD arrays, photo multiplier tubes or

combinations thereof.

9.(original) The medical device of claim 1, wherein the blood sample comprises hemolyzed blood.

10.(original) The medical device of claim 1, further comprising at least one light source emitting light in the high visible to infra red region of the electromagnetic spectrum.

11.(original) The medical device of claim 10, wherein the blood sample comprises non-hemolyzed blood.

12.(original) The medical device of claim 10, wherein the light source emits light in the range of about 650 nanometers to about 1000 nanometers.

13.(original) The medical device of claim 10; wherein the light receiving detector lies on the same plane as the plane used to measure the reflectance of the blood sample.

14.(original) The medical device of claim 10, wherein the absorbance and/or reflectance is used to measure and/or calculate the hematocrit and/or to measure all hemoglobin derivatives as total hemoglobin of non-hemolyzed blood sample.

15.(original) The medical device of claim 1, comprising at least two compact light sources for distinguishing two or more hemoglobin derivatives.

16.(original) The medical device of claim 1, comprising at least three compact light sources for distinguishing three or more hemoglobin derivatives.

17.(original) The medical device of claim 1, comprising at least five compact light sources for distinguishing five or more hemoglobin derivatives.

18.(original) The medical device of claim 1, comprising at least three compact light sources for distinguishing two or more hemoglobin derivatives, wherein one light source emits light in the high visible to infra red region of the electromagnetic spectrum.

19.(original) The medical device of claim 1, wherein the hemoglobin derivatives to be measured are oxyhemoglobin, reduced hemoglobin, partial hemoglobin, carboxyhemoglobin, methemoglobin, fetal hemoglobin and/or sulfhemoglobin.

20.(original) The medical device of claim 1 wherein the device

further yields values for total hemoglobin, hematocrit, oxygen saturation, fractional oxygen saturation, oxygen content and/or oxygen capacity.

21.(original) The medical device of claim 1, wherein the microprocessor comprises software capable of validating and/or adjusting the measured concentrations and/or percentages of hemoglobin derivatives by use of one or more ratiometric curves.

22.(original) The medical device of claim 1, wherein the device is battery powered.

23.(original) The medical device of claim 21, wherein the ratiometric calibration curves comprise known ratios of absorbance values taken from absorbance spectra comprising more than one hemoglobin derivative.

24.(original) The medical device of claim 21, wherein the ratiometric curves comprise spectral data for combinations of two or more hemoglobin derivatives at various known concentrations.

25.-52. (withdrawn)